

Summary of Factors Justifying an ECAD Safe Harbor for Multifamily High Energy Users

- (1) **The vast majority of Multifamily Owners are striving to cooperate with the ECAD Ordinance, and many—not just potentially High Energy Users—are implementing, at their own expense, energy efficiency improvements which are recommended. Only about 5% of MF properties are High Energy Users, and the vast majority of these MF owners are also expected to be cooperative with the ECAD Ordinance. However, when a cooperating MF High Energy User performs all of the recommended cost-effective energy efficiency improvements, and yet is unable to achieve the desired 20% reduction target, he should not be required to undertake non-cost-effective measures, of the sort listed in the amended paragraph 6-7-23(B). This is particularly true because the marginal failure may be due to property-by-property variations and factors beyond the control of the MF owner.**
- (2) **From the beginning, the EEU Task Force and the previous Council focused the ECAD Ordinance upon cost-effective energy efficiency improvements, and stated that non-cost-effective improvements were not intended to be required.**
- (3) **Because all MF properties only comprise about 10.7% of Austin's energy demand, and only 5% are High Energy Users, and only a portion of these will be unable to achieve the 20% reduction in energy consumption via cost-effective improvements, and because even these few should be able to achieve around a 10% reduction, it follows that the "energy cost" of the safe harbor for these few MF High Energy Users is a Delayed Energy Savings of only 0.04% of the Austin Energy Demand! Therefore, if the safe harbor were denied, it could not be to save energy, but rather to "make a punitive example" of these few cooperating MF High Energy Users.**
- (4) **The number of Residential (1-4 units) Energy Users whose energy consumption (kWH/Yr) exceeds that of a MF High Energy User with a property whose EUI is near the 150% of EUI_{AV} threshold, is larger than the total number of MF High Energy Users by more than an order of magnitude. And yet these more numerous Residential High Energy Users are not required to perform even the cost-effective energy efficiency improvements.**
- (5) **The EUI energy density (kWH/SF-Yr) competition used to determine MF High Energy Users is vulnerable to distortions for smaller properties with high density occupancy, and has many issues of "technical unfairness" related to property-by-property variations. This makes it problematical to base punitive sanctions upon this competition, which may be ruinous to the MF owner, and may not even be in the best interest of the tenants of the High Energy User property.**

What is the Energy Cost of allowing a “Safe Harbor” for Multifamily High Energy Users?

If cooperating multifamily High Energy Users perform all recommended, cost-effective energy efficiency improvements, but fail to achieve the desired 20% improvement in energy efficiency, and are nevertheless spared having to make very costly improvements by the “safe harbor” language proposed for the ECAD ordinance, how large is the incremental energy savings which is therefore delayed?

	Multifamily	Residential	Commercial	Other	Total
AE 2007 Distribution of Energy Demand(kWH/Yr) [Fourplexes incl. in MF]	11.0%	31.0%	41.0%	17.0%	100%
Shift 4-plexes to Residential	-0.3%	+0.3%			
Adj. Energy Demand	10.7% (5+ units)	31.3% (1-4 units)	41%	17%	100%

- (1) 5% of multifamily properties are High Energy Users, for which EUI(kWH/SF-Yr) exceeds 150% EUI_{AV} (say $F_1 = 160\%$).
- (2) Some fraction (say $F_2 = 50\%$) of High Energy Users may be able to reduce their EUI by at least 20% through cost-effective measures.
- (3) The remaining fraction ($1-F_2 = 50\%$ also) of High Energy Users may only be able to reduce their EUI by 10% through cost-effective energy improvements.
- (4) Failure to require these cooperating High Energy Users to immediately implement costly (non-cost-effective) energy efficiency improvements sufficient to reach the 20% reduction threshold, will therefore delay additional reduction in their EUI of $F_3 = 20\% - 10\% = 10\%$.
- (5) High Energy User Properties are believed to have a size (SF) which is smaller than average (say $F_4 = 90\%$ of average size).

CONCLUSION: The delayed energy savings (kWH/Yr) is approximately

$$\begin{aligned}
 \text{Energy Savings} &= [F_4] [F_3] [1-F_2] [F_1] [5\%] [10.7\%] \\
 &= [90\%] [10\%] [50\%] [160\%] [5\%] [10.7\%] \\
 &= 0.04\% = 0.0004 \text{ of the total Austin Energy Demand}
 \end{aligned}$$

(This is no mistake; the delayed Energy Savings are only one twenty-fifth of one percent of the total Austin Energy Demand!)

Therefore, the MF High Energy User “Safe Harbor” cannot be denied as an energy-saving measure.

How much energy is annually consumed (kWH/Yr) by an Average Residential (1-4 units per property) User, compared to a Multifamily High Energy User?

- (1) Compared to an average Multifamily User, a Multifamily High Energy User is estimated to consume more energy (kWH/Yr) by a factor of

$$160\% (\text{kWH/SF-Yr}) \times 90\%(\text{SF}) = 144\% (\text{kWH/Yr})$$

where 160% is the estimated EUI enhancement (kWH/SF-Yr), and 90% is the estimated square footage reduction factor.

- (2) Compared to an average Multifamily User, an Average Residential User is estimated to annually consume more energy (kWH/Yr) by a factor of

$$\frac{31.3\%(\text{total residential demand})}{10.7\%(\text{total multifamily demand})} \times \frac{1 (\text{multifamily user})}{2 (\text{residential users})} = 146\% (\text{kWH/Yr})$$

where 31.3%/10.7% is the ratio of respective aggregate energy consumption/year, and 1/2 is the ratio of multifamily users to residential users.

CONCLUSION: Average Residential Users consume about as many kWH/Yr as do Multifamily High Energy Users. However, there are approximately 40 times as many Residential Users as there are Multifamily High Energy Users!

It makes no sense to subject the very few, cooperating Multifamily High Energy Users to costly (non-cost-effective) energy efficiency improvements, while at the same time not requiring the much more numerous Residential Energy Users to perform even the cost-effective improvements. It is illogical policy, and is manifestly unfair.

Issues of Technical Unfairness, or Ambiguities in the High Energy User EUI Competition

- (1) How does Austin Energy know that EUI_{AV} is not too low because of unfair advantages possessed by very-low-EUI properties?
 - ◆ Properties with high vacancy
 - ◆ Properties with units out of service
 - ◆ Properties with broken HVAC
 - ◆ Properties with low income residents relying upon fans rather than HVAC
 - ◆ Properties with gas energy used intensively (central heating, hot water heating, cooking)

- (2) How does Austin Energy know that EUI of Multifamily High Energy Users is not too high because of unfair energy burdens upon the MF owner, or issues beyond his control?
 - ◆ Properties with high income residents wishing to overuse the HVAC, or possessing a large quantity of electronic equipment
 - ◆ Properties with low vacancy, and/or high density occupancy
 - ◆ Properties with electric clothes washers and dryers within the units
 - ◆ Properties with gas present but used very sparingly (and electric power used instead)
 - ◆ Older properties with leaky windows, leaky but inaccessible air ducts, flat roofs with inaccessible attics, and/or functional but lower SEER HVAC units
 - ◆ Properties with unfavorable architecture, unfavorable building orientation, unfavorable geography, and/or unfavorable landscaping

CONCLUSION: Despite best intentions and best efforts, a truly fair EUI competition is practically impossible, due to property-to-property variations beyond the control of the Multifamily owners.

Subj: FW: Outlier Multifamily High Energy Users (ECAD)
Date: 4/18/2011 8:56:47 AM Central Daylight Time
From: Tim.Arndt@austinenergy.com
To: Stuart.Reilly@austinenergy.com
CC: JRT3308@aol.com, Tim.Kisner@austinenergy.com

Stuart-

Mr. Thompson asked if I could forward you his email.

Tim Arndt
 Austin Energy
 811 Barton Springs Rd.
 Austin, TX 78704-1145
 512.482.5387
 512.983.6769 -m
 512.505.3932 -f

[View the City of Austin's ECAD ordinance](#)

From: JRT3308@aol.com [mailto:JRT3308@aol.com]
Sent: Sunday, April 17, 2011 10:39 PM
To: stuart.reilly@ci.austin.tx.us; Yebra, Fred; Arndt, Tim
Cc: kristan@austinaptassoc.com; sarah@martineproperties.com; seckhardt@milestone-mgt.com;
billr@graniteproperties.com; bdunkerley1@austin.rr.com; Levinski, Robert
Subject: Outlier Multifamily High Energy Users (ECAD)

Stuart, Fred, Tim, & All,

I thought that we had a productive discussion last Wednesday, in seeking an ECAD Ordinance revision which would provide a "safe harbor" to our cooperating Multifamily High Energy Users, so that they would not be required to make limitless energy efficiency improvements which would exceed the cost effective improvements which appear to have been the original intent of the EEU Task Force and the Council.

Stuart and Tim disclosed to us for the first time at this meeting, the existence of a very few "outlier" MF High Energy Users, whose EUI was reported to exceed 300%, and in one case perhaps even 500% of the EUI-AV for their cohort. Stuart suggested that this might mean that the tenants of these properties may be paying utility bills 3 - 5 times higher than normal, which might justify a draconian ordinance provision to force "bad apple" MF owners to drastically improve the energy efficiency of these outlier properties. Sarah Thompson correctly observed that although AAA has no interest in protecting "bad apple" MF owners, we needed some time to assess this information, which was brand new to us.

During the days since our meeting, I have thought some about this outlier situation, from the scientific point of view, and I thought that I might share my views herewith. Although one is tempted to jump to the conclusion that irresponsible MF owners may be neglecting their property to their tenants' disadvantage, I am inclined to believe that this conclusion is unlikely to be the primary explanation for this situation, as explained below.

First, recall that the EUI (kWH/SF-Yr) is an average energy density consumption rate—whereas the parameter of primary importance to the City and to the residents is the energy consumption rate (kWH/Yr). It is the latter factor which affects the bills of the residents, and the need for new power plants. The EUI density was invented to allow large area MF properties to compete against small area MF properties in a fairer way (although still not necessarily fair enough). Because the EUI is a derived quantity, it is subject to some distortion. Because a certain amount of energy consumption follows the occupancy rather than the square footage (e.g., cooking, personal electronics, hot water usage, appliance usage, clothes washing/drying, etc.), it follows that very small apartments might be expected to have abnormally high EUI's. In fact, I will hazard a guess that the MF outlier properties may likely have very small square footage per resident. The sort of property that I imagine to possess a very high EUI might be an older frame house in the UT area, with a number of small individual rooms rented to

perhaps a couple of students each. Maybe they have a lot of personal electronics, and appliances in each of their rooms. Possibly the house has high ceilings (hence, higher heating and cooling costs), and limited wall or attic insulation. It might have leaky but largely inaccessible air ducts. There might be asbestos and lead based paint present, which would make renovations prohibitively expensive. Perhaps the HVAC is older, with lower SEER and COP, but still functional, and not yet ready for replacement. Possibly there are interior clothes washers/dryers which are not separately metered for electricity. The windows might be somewhat leaky, but extremely expensive to replace. Perhaps the building does not benefit from a favorable exposure, or good tree shade, and perhaps it is now surrounded by other buildings which block the breezes. Maybe the house even functions as a "boarding house", with meals prepared and served to both residents and non-residents, and the meal preparation energy may be included on the main house meter--attributed to the living space (not separately metered).

I think that it is understandable that such a hypothetical property might very well have an EUI density which is very much above normal. However, with smaller SF per room, the actual energy consumption (kWH/Yr) will be less exorbitant than the EUI energy density, although the energy consumption will likely still be above average. However--and this is the crucial point--are these student residents really being exploited by the MF owner?

I suggest that the answer is: "not likely". The reason is that in my experience (25 years as a tenant, 32 years as a landlord), the vast majority of residents, and particularly student residents, are not at all stupid. They are quite capable of assessing the competitive economics, and if they were asked to pay 3 - 5 times the usual utility bill, with no offsetting compensation, they would simply move elsewhere. In the hypothetical example mentioned above, the landlord might very well offer a reduced rent, to compensate the residents for above-average utility bills. Only if the residents were happy with the offer, would they accept it. Or perhaps the house is among the few properties without individual utility meters, and the cost of utilities is paid by the landlord and is simply built into the rent. Therefore, in effect in either case, the landlord would be the party bearing the burden of higher than normal utility costs--and yet his reduced operating profit might still be his best option under the circumstances, short of demolishing the older house and redeveloping the property. From the student tenants' point of view, it may be a blessing for the landlord to keep such older rental property available, since it may be more affordable than a modern property development might be. Supposedly, the City of Austin has some interest in maintaining a supply of relatively affordable housing, although one sometimes wonders when there are so many programs such as this ECAD ordinance which act to raise housing costs. (It often seems that whoever is in charge of affordable housing for the City, does not communicate much with the other City departments.)

Anyway, as this hypothetical example illustrates, the free market is capable of remarkable flexibility, whereby, for example, unique older property may be kept operational without anyone being disadvantaged economically. In contrast, centrally planned ordinance mandates have much less flexibility, and are prone to innumerable unintended consequences, since it is practically impossible for an ordinance to properly account for the myriad property-by-property variations.

It remains possible, of course, that there are indeed some "bad apple" MF owners who are neglecting to make common sense improvements to their property. However, I believe that our suggested ordinance revision would still require such owners to perform the needed cost effective improvements. And the vast majority of well-meaning, cooperating MF owners would not be unduly penalized by the ordinance, if revised as we (AAA) have suggested.

Respectfully,

Bob Thompson
Member, Legislative Committee
Austin Apartment Association